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| **20EE403**  **Hall Ticket Number:**   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  |  |      |  |  |  | | --- | --- | --- | | **II/IV B.Tech DEGREE(Regular) EXAMINATION** | | | | **August,2022** | **Electrical and Electronics Engineering** | | | **Fourth Semester** | **Induction motors & synchronous machines** | | | **Time: Three Hours** | | **Maximum:70 Marks** | |  |
| |  |  | | --- | --- | | ***Answer question 1 compulsory.*** | **(14X1 = 14 Marks)** | | ***Answer one question from each unit.*** | **(4X14=56 Marks)** | |  |

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| 1. | a) | Name different types Induction Motors | CO1 |  |
|  | b) | What is the limitation of DOL starter? | CO1 |  |
|  | c) | Define Synchronous Speed | CO1 |  |
|  | d) | Why rotor iron losses are neglected in induction motors? | CO1 |  |
|  | e) | State the applications of Single Phase Induction motors | CO2 |  |
|  | f) | What is the purpose of centrifugal switch in Single Phase Induction Motors? | CO2 |  |
|  | g) | What is the slip in single phase induction motors with respect to backward rotating magnetic field? | CO2 |  |
|  | h) | Which type of Synchronous Machine is used for low operating speed? | CO3 |  |
|  | i) | What do you mean by Synchronization? | CO3 |  |
|  | j) | What is the use of Potier Triangle? | CO3 |  |
|  | k) | Name the most accurate method of finding synchronous Generator voltage regulation | CO3 |  |
|  | l) | What is used to prevent Hunting? | CO4 |  |
|  | m) | State any two special features of Synchronous Motor | CO4 |  |
|  | n) | What is Load Angle in Synchronous Motors? | CO4 |  |
| **Unit –I** | | | | |
| 2. | a) | Explain the construction and working principle of three-Phase Induction Motor | CO1 | 7M |
|  | b) | Derive the torque equation of three-Phase Induction Motor draw and discuss the characteristics of Torque and Slip-Speed of 3-Phae I.M | CO1 | 7M |
| **(OR)** | | | | |
| 3. | a) | Explain the stator voltage control method of induction motor Speed control | CO1 | 7M |
|  | b) | A 3-phase, 400 V, 6 pole, 50hz induction motor takes a power input of 35 KW at its full load speed of 980rpm. The total stator losses are 1 KW and the friction and windage losses are 1.5 KW. Calculate a) Slip b) Rotor ohmic losses c) Shaft power d) shaft torque e) Efficiency | CO1 | 7M |
| **Unit –II** | | | | |
| 4. | a) | Explain the Double Field Revolving Theory | CO2 | 7M |
|  | b) | Show the equivalent circuit diagram of single phase induction motor | CO2 | 7M |
| **(OR)** | | | | |
| 5. | a) | Explain the working of capacitor Start Induction Run Motor | CO2 | 7M |
|  | b) | What is Shaded Pole Motor? Explain its operation | CO2 | 7M |
| **Unit –III** | | | | |
| 6. | a) | Explain the procedure involved for EMF method to calculate regulation of an alternator | CO3 | 7M |
|  | b) | Explain Blondel’s Two-Reaction theory with a neat sketch | CO3 | 7M |
| **(OR)** | | | | |
| 7. | a) | Derive the expression for Distribution Factor (Kd) | CO3 | 7M |
|  | b) | The stator of a 3-phase , 8 pole Synchronous generator driven at 750 rpm has 72 slots. The winding has been made with 36 coils having 10 turns per coil. Calculate rms value of the induced emf per phase if flux per pole is 0.15 wb. Assume full pitched coils have been used. | CO3 | 7M |
| **Unit –IV** | | | | |
| 8. | a) | Explain the operation of Synchronous Condenser | CO4 | 7M |
|  | b) | Explain any two starting methods of starting a synchronous motor | CO4 | 7M |
| **(OR)** | | | | |
| 9. | a) | Explain V and Inverted V curves of a Synchronous Motor | CO4 | 7M |
|  | b) | Explain the phenomena of Hunting. Explain its causes and Effects in synchronous motor. | CO4 | 7M |

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